Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. **(Previously amended)** A circuit to control the capacitance of a variable capacitor in a strictly linear mode through a steady tuning voltage and to achieve a high Q-factor at the same time; comprising:

   a set of individual small capacitors;

   a set of capacitor switching stages, each stage comprising;

   a switching device, allowing a steady ramp-up/ramp-down phase between the points of being fully switched on and fully switched off, and where said switching device is connected in series with one of said capacitors, to connect a multiple of said capacitors in parallel;

   a circuit to control the switching operation of said switching device in a steady ramp-up/ramp-down manner between the points of being fully switched on and fully switched off, comprising:

   a translinear amplifier to produce a ramp-up/ramp-down signal for said switching device, where said translinear amplifier is implemented within said circuit to control the switching operation;

   a circuit to individually provide input and output reference levels for each of said capacitor switching stages, building the input reference levels and the output reference levels for each of said translinear amplifiers, comprised within said capacitor switching stages;

   and

an input signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, provided to the inputs of all of said capacitor switching stages.

2. **(Previously amended)** The circuit of claim **1** wherein said switching device with steady ramp-up/ramp-down phase is a FET transistor.

3. **(Previously amended)** The circuit of claim **2** wherein said switching device with steady ramp-up/ramp-down phase is a P-channel or N-channel junction FET.

4. **(Previously amended)** The circuit of claim **2** wherein said switching device with steady ramp-up/ramp-down phase is a PMOS or NMOS FET.

5. **(Previously cancelled)**

6. **(Previously amended)** The circuit of claim **1** wherein said circuit to generate a set of input referencelevels, one for each of said capacitor switching stages, is implemented as a chain of resistors.

7. **(Original)** The circuit of claim **1** wherein said translinear amplifier has a gain of 1, the typical gain of translinear amplifiers.

8. **(Previously amended)** The circuit of claim **1** wherein said translinear

amplifier has a gain differing from 1, which gives one more degree of freedom to

optimize the operating parameters by making the steepness of the switching

device's gate control voltage versus tuning voltage adjustable through proper gain

selection, thus making the overlapping of capacitor switching operation

independent of the selected distance of the switching points of adjacent capacitor

stages.

9. **(Previously amended)** The circuit of claim **1** wherein said circuit to provide a

signal, dependent on the tuning voltage, dedicated for the voltage controlled

capacitance change, is a single signal connected to all of said capacitor switching

stages.

10. **(Previously amended)** The circuit of claim **1** wherein said circuit to provide

said output reference levels for each of said capacitor switching stages, building

the output reference levels of said translinear amplifiers, is implemented by a

single signal, connected to all translinear amplifier's output reference points in

common.

11. **(Original)** The circuit of claim **1** wherein said capacitors are discrete capacitor

components.

12. **(Previously amended)** The circuit of claim **1** wherein said capacitors are manufactured on a planar carrier, separate from the circuit carrier.

13. **(Original)** The circuit of claim **1** wherein said capacitors are integrated on a semiconductor substrate, but on a separate substrate than said switching devices and amplifiers.

14. **(Original)** The circuit of claim **1** wherein said capacitors are integrated on a semiconductor substrate and on the same substrate as said switching devices and amplifiers.

15. **(Original)** The circuit of claim **1** wherein said capacitors are manufactured as a Metal-Oxide structure.

16. **(Original)** The circuit of claim **1** wherein said capacitors are manufactured as a junction capacitor.

17. **(Previously amended)** A circuit to control the capacitance of a variable capacitor in a strictly linear mode through a steady tuning voltage and to achieve a high Q-factor at the same time, by controlling a multiple of switching devices through steady control signals when said switching devices operate within their steady ramp-up/ramp-down area and by sharply cutting off the control signals,

when said switching devices operate outside their steady ramp-up/ramp-down area; comprising:

a set of individual small capacitors;

a set of capacitor switching stages, each stage comprising:

a switching device allowing said steady ramp-up/ramp-down phase between the points of being fully switched on and fully switched off, and where said switching device is connected in series with one of said capacitors, to connect a multiple of said capacitors in parallel;

a circuit to control the switching operation of said switching device in a steady ramp-up/ramp-down manner, comprising:

a translinear amplifier to produce a steady ramp-up/ramp-down signal for said switching device, where said translinear amplifier is implemented within said circuit to control the switching operation;

a circuit to drive said switching device to a fully on status, when said switching device operates outside said steady ramp-up/ramp-down area on said switching device's low resistance side, and implemented in combination with said translinear amplifier;

a circuit to drive said switching device to a fully off status, when said switching device is beyond said steady ramp-up/ramp-down area on said switching device's high resistance side, and implemented in combination with said translinear amplifier;

a circuit to individually provide input and output reference levels for each of said capacitor switching stages, building the input reference levels and the output reference levels for each of said translinear amplifiers, comprised within said capacitor switching stages; and

an input signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, provided to all of said capacitor switching stages.

18. **(Previously amended)** The circuit of claim **17** wherein said circuit to drive said switching device to a fully-on status, when said switching device operates outside its desired steady transition area on the lower resistance side is provided by additional circuit elements, working as a signal cutoff function.

19. **(Previously amended)** The circuit of claim **17** wherein said a circuit to drive said switching device to a fully-off status, when said switching device operates outside its desired steady transition area on the higher resistance side is provided by additional circuit elements, working as a signal cutoff function.

20. **(Previously amended)** The circuit of claim **18** wherein said signal cutoff function to drive said switching device to a fully-on status, when said switching device operates outside its desired steady ramp-up/ramp-down area on said switching device's low resistance side, is implemented within said translinear amplifier circuit.

21. **(Previously amended)** The circuit of claim **19** wherein said signal cutoff function to drive said switching device to a fully-off status, when said switching device operates outside its desired steady ramp-up/ramp-down area on said switching device's high resistance side, is implemented within said translinear amplifier circuit.

22. **(Original)** The circuit of claim **17** wherein said translinear amplifier has a gain of 1, the typical gain of translinear amplifiers.

23. **(Previously amended)** The circuit of claim **17** wherein said translinear amplifier has a gain differing from 1, which gives one more degree of freedom to optimize operating parameters, like overlapping of capacitor switching operation and signal cutoff at the edges of said steady ramp-up/ramp-down area.

24. **(Previously Cancelled)**

25. **(Previously Cancelled)**

26. **(Previously amended)** A circuit to control the capacitance of a variable capacitor in a strictly linear mode through a steady tuning voltage and to achieve a high Q-factor at the same time, by controlling a multiple of capacitor switching devices through steady control signals and by compensating the temperature deviation of said capacitor switching devices; comprising:

a set of individual small capacitors;

a set of capacitor switching stages, each stage comprising:

a switching device allowing a steady ramp-up/ramp-down phase between the points of being fully switched on and fully switched off, and where said switching device is connected in series with one of said capacitors to connect a multiple of said capacitors in parallel;

a circuit to control the switching operation of said switching device, in a steady ramp-up/ramp-down manner, comprising:

a translinear amplifier to produce a control signal for said switching device, and implemented within said circuit to control the switching operation;

a circuit to compensate the temperature deviation of said switching device, and implemented within said circuit to control the switching operation;

a circuit to individually provide input and output reference levels for each of said capacitor switching stages, building the input reference levels and the output reference levels for each of said translinear amplifiers, comprised within said capacitor switching stages; and

an input signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, provided to all of said capacitor switching stages.

27. **(Previously amended)** The circuit of claim **26** wherein said circuit to compensate the temperature deviation of said switching device is provided by

feeding a modified reference voltage to said translinear amplifier's output reference point, to mirror a temperature correcting signal into the control signal of said switching device.

28. **(Previously amended)** The circuit of claim **27** wherein said circuit to compensate the temperature deviation of said switching device, uses a device of the same type as said switching device itself, to produce an exact equivalent of said temperature deviation.

29. (Previously Cancelled)

30. **(Previously amended)** The circuit of claim **1** wherein said circuit to individually provide said input reference levels for each of said capacitor switching stages, generates a set of reference values, one value for each capacitor switching stage, in a non-linear relation between said tuning voltage and said input reference levels.

31. **(Previously amended)** The circuit of claim **30** wherein said circuit to individually provide said input reference levels, for each circuit to control the switching operation in a non-linear relation between said tuning voltage and said input reference levels, is provided by specifically selecting the steps of a set of reference values in a way, to achieve said desired non-linear relation.

32. **(Previously amended)** The circuit of claim **31** wherein said circuit to generate

said set of input reference levels, one for each of said circuit to control the

switching operation in a non-linear relation, is implemented as a chain of resistors.

33. **(Currently amended)** A method to control the capacitance of a variable

capacitor in a strictly linear mode through a tuning voltage and to achieve a high

Q-factor at the same time; comprising:

　　　　providing a set of individual small capacitors, a set of capacitor switching

stages, each comprising: a switching device allowing a steady ramp-up/ramp-

down phase between the points of being fully switched on and fully switched off,

and where said switching device is connected in series with one of said capacitors,

to connect a multiple of said capacitors in parallel, a circuit to control the switching

operation of said switching device in a ramp-up/ramp-down manner between the

points of being fully switched on and fully switched off and comprising a

translinear amplifier, and a circuit to individually provide input and output

reference levels for each of said capacitor switching stages, an input signal,

dependent on the tuning voltage, dedicated for the voltage controlled capacitance

change and provided to all of said capacitor switching stages;

　　　　providing an individual input and output reference level for each individual

capacitor switching stage;

　　　　supplying said signal, dependent on the tuning voltage, dedicated for the

voltage controlled capacitance change, to all of said capacitor switching stages;

16

amplifying, by means of said translinear amplifier, the a difference of said

tuning voltage and said input reference level within each capacitor switching stage,

to produce the a linear control signal for a ramp-up/ramp-down switching

operation;

fully switching on one of said switching devices in order to completely switch

one of said small capacitors in parallel to the already switched on capacitors, one

after the other to linearly increase the total capacitance;

fully switching off one of said switching devices in order to completely

disconnect one of said small capacitors from the other switched on capacitors, one

after the other, to linearly decrease the total capacitance; and

ramping up or ramping down the switching operation of one of said

switching devices to partially switch, with increasing/ or decreasing share, one of

said small capacitors in parallel to the already switched on capacitors, one after

the other.

34. **(Previously amended)** The method of claim **33** wherein linearly controlling

the switching operation applies to a FET transistor as the switching device with

steady ramp-up/ramp-down phase..

35. **(Previously amended)** The method of claim **34** wherein linearly controlling the switching operation applies to a P-channel or N-channel junction FET as said switching device with steady ramp-up/ramp-down phase.

36. **(Previously amended)** The method of claim **34** wherein linearly controlling the switching operation applies to a P-channel or N-channel MOS FET as said switching device with steady ramp-up/ramp-down phase.

37. **(Previously amended)** The method of claim **33** wherein individually providing said input and output reference levels for each individual capacitor switching stage, generates two sets of reference values, oneset of input reference levels and one set of output reference levels.

38. **(Previously amended)** The method of claim **37** wherein generating a set of reference values, one for each of said capacitor switching stages, is performed by a chain of resistors.

39. **(Original)** The method of claim **33** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors applies to discrete capacitor components.

40. **(Previously amended)** The method of claim **33** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors

applies to capacitors manufactured on a planar carrier, separate from the circuit carrier.

41. **(Original)** The method of claim **33** wherein continually switching on one of said small capacitors in parallel to the already switched on capacitors applies to capacitors integrated on a semiconductor substrate.

42. **(Previously amended)** The method of claim **33** wherein supplying a tuning voltage, dedicated for the voltage controlled capacitance change, to all of said capacitor switching stages uses a single signal connected to all amplifier inputs.

43. **(Currently amended)** A method to control the capacitance of a variable capacitor in a strictly linear mode through a tuning voltage and to achieve a high Q-factor at the same time by sharply cutting off the control signal, when a switching device operates outside its steady ramp-up/ramp-down area; comprising:

providing a set of individual small capacitors, a set of capacitor switching stages, each comprising: a switching device allowing a steady ramp-up/ramp-down phase between the points of being fully switched on and fully switched off, and where said switching device is connected in series with one of said capacitors, to connect a multiple of said capacitors in parallel, a circuit to control the switching operation of said switching device in a ramp-up/ramp-down manner between the points of being fully switched on and fully switched off and comprising, in addition

to a translinear amplifier, a circuit to take over control of said switching device to drive it to a fully-on status, when said switching device operates outside its steady ramp-up/ramp-down area on said switching device's low resistance side as well as a circuit to take over control of said switching device to drive it to a fully-off status, when said switching device is beyond its steady ramp-up/ramp-down area on said switching device's high resistance side,   and a circuit to individually provide input and output reference levels for each of said capacitor switching stages, an input signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change and provided to all of said capacitor switching stages;

providing an individual input reference level for each individual capacitor switching stage;

supplying said signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said capacitor switching stages;

amplifying, with said translinear amplifier, the difference of said tuning voltage and said individual input reference level within each capacitor switching stage, to produce the linear control signal for a ramp-up/ramp-down switching operation;

steadily ramp-up/ramp-down switching on or off said switching device in order to partially switch, with increasing/_or_decreasing share, said small capacitor in parallel to the already switched on capacitors, one after the other, to linearly increase or decrease the total capacitance;

linearly controlling the switching function for each of said switching device

with steady ramp-up/ramp-down phase, when said switching device is in its steady

ramp-up/ramp-down area;

driving said switching device to a fully on status, when said switching device

operates outside its steady ramp-up/ramp-down area on said switching device's

low resistance side; and

driving said switching device to a fully off status, when said switching device

is beyond its steady ramp-up/ramp-down area on said switching device's high

resistance side.

44. **(Previously amended)** The method of claim **43** wherein driving said

switching device to a fully-on status, when said switching device operates outside

its desired steady ramp-up/ramp-down area on said switching device's low

resistance side uses additional circuit elements, working as a signal cutoff

function.

45. **(Previously amended)** The method of claim **43** wherein driving said

switching device to a fully-off status, when said switching device operates outside

its steady ramp-up/ramp-down area on said switching device's high resistance

side uses additional circuit elements, working as a signal cutoff function.

46. **(Previously amended)** The method of claim **44** wherein said signal cutoff

function to drive said switching device to a fully-on status, when said switching

device operates outside its steady ramp-up/ramp-down area on the low resistance is implemented within said translinear amplifier.

47. **(Currently amended)** A method to control the capacitance of a variable capacitor in a strictly linear mode through a tuning voltage and to achieve a high Q-factor at the same time and to compensate the temperature deviation of the capacitor switching device; comprising:

providing a set of individual small capacitors, a set of capacitor switching stages, each comprising: a switching device with steady ramp-up/ramp-down phase to continually switch on said capacitors in parallel, a circuit to control the switching operation of said switching device and comprising a translinear amplifier, a circuit to compensate the temperature deviation of said switching device , and a circuit to individually provide input and output reference levels for each individual capacitor switching stage, an input signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change and provided to all of said capacitor switching stages;

providing an individual input reference level for each individual capacitor switching stage;

supplying said signal, dependent on the tuning voltage, dedicated for the voltage controlled capacitance change, to all of said capacitor switching stages;

_amplifying, with said translinear amplifier, the difference of said tuning voltage and said individual input reference level within each capacitor switching

stage, to produce ~~the~~ a linear control signal for a ramp-up/ramp-down switching

operation;

continually switching on one of said switching devices with steady ramp-

up/ramp-down phase in order to switch one of said small capacitors in parallel to

the already switched on capacitors, one after the other;

linearly controlling the switching function for each of said switching devices

with steady ramp-up/ramp-down phase; and

compensating the temperature deviation of said switching device, using said

circuit to compensate the temperature deviation of said switching device.

48. **(Original)** The method of claim **47** wherein compensating the temperature

deviation of said switching device is provided by feeding a modified reference

voltage to said translinear amplifier's output reference point, to mirror a

temperature correcting signal into the control signal of said switching device.

49. **(Original)** The method of claim **48** compensating the temperature deviation of

said switching device, uses a device of the same type as said switching device

itself, to produce an exact equivalent of said temperature deviation.

50. (Previously Cancelled)

51. **(Previously amended)** The method of claim **33** wherein individually providing

said input reference levels for each individual capacitor switching stage generates

a set of reference values, one value for each capacitor switching stage in a non-linear relation between said tuning voltage and said input reference levels.

52. **(Previously amended)** The method of claim **51** wherein providing a non-linear relation between said tuning voltage and said input reference levels is provided by specifically selecting the steps of said set of reference values in a way, to achieve said desired non-linear relation.